7.3 EVOLUTION AND SPECIATION

Selection

- Selection pressures are factors that limit the population
  - Competition for resources
    - Intraspecific competition
  - Disease
  - Predation
- Results in the better-adapted individuals surviving and reproducing
  - They pass on the advantageous alleles to the next generation
    - Changes allele frequency in the gene pool of the population over time
      - Evolution

Variation

Variation must be present for selection to occur

- Sources of variation
  - Random fertilisation of gametes (producing new combinations)
  - Meiosis
  - Gene mutation
- Due to genetic and environmental factors
- Wide variation in phenotype in a population

Types of selection

- Stabilising selection
  - Selects against extreme phenotypes, favours the average
    - Human birth weights
- Disruptive selection
  - Both extremes are selected for, generating two sub-populations
- Directional selection
  - Mean phenotype shifts to left or right, one extreme is selected for
    - Antibiotic resistance in bacteria

Speciation

- Populations are separated from each other
  - Allopatric speciation
    - Geographical separation
  - Sympatric speciation
    - Subpopulations are in the same geographical area
- Genetic drift in small populations
  - Faster development of a new species
  - Selection within each subpopulation
    - Changes in allele frequency in each subpopulation
      - Cannot interbreed with the other species
      - New species form

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